U.S. DEPARTMENT OF EDUCATION

GreenRibbonSchools

U.S. Department of Education Green Ribbon Schools 2013

For Public Schools only: [ ] Charter [x] Title I [ ] Magnet [ ] Choice

Name of Principal Robert L. Kern
(Specify: Ms., Miss, Mrs., Dr., Mr., etc.) (As it should appear in the official records)

Official School Name Nazareth Area Middle School
(As it should appear in the official records)

School Mailing Address 94 Friedenstahl Avenue
(If address is P.O. Box, also include street address.)

Nazareth	PA	18064
City	State	Zip

County Northampton State School Code Number* 3494

Telephone (610) 759-3350 Fax (610) 759-3725

Web site/URL www.nazarethasd.k12.pa.us E-mail rkern@nazarethasd.org

I have reviewed the information in this application and certify that to the best of my knowledge all information is accurate.

x Robert L. Kern, J. Date 2/12/2013
(Principal's Signature)

Name of Superintendent* Dennis L. Riker, Ed.D.
(Specify: Ms., Miss, Mrs., Dr., Mr., Other)

District Name* Nazareth Area School District Tel.(610) 759-1170, ext. 1111

I have reviewed the information in this application and certify that to the best of my knowledge all information is accurate. This is one of the highest performing green schools in my jurisdiction.

Date 2/12/2013
(Superintendent's Signature)

**Private Schools: If the information requested is not applicable, write N/A in the space.*

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PART II – SUMMARY OF ACHIEVEMENTS

Instructions to School Principal

Provide a concise and coherent "snapshot" that describes how your school is representative of your jurisdiction's highest achieving green school efforts in approximately 800 words. Summarize your strengths and accomplishments. Focus on what makes your school worthy of the title U.S. Department of Education Green Ribbon School.

PART III – DOCUMENTATION OF STATE EVALUATION OF NOMINEE

Instructions to Nominating Authority

The Nominating Authority must document schools' high achievement in each of the three ED-GRS Pillars and nine Elements. For each school nominated, please attach documentation in each Pillar and Element. This may be the Authority's application based on the Framework and sample application or a committee's written evaluation of a school in each Pillar and Element.

Nominating Authority's Certifications

The signature by the Nominating Authority on this page certifies that each of the statements below concerning the school's eligibility and compliance with the following requirements is true and correct.

1. The school has some configuration that includes one or more of grades K-12. (Schools on the same campus with one principal, even a K-12 school, must apply as an entire school.)

2. The school is one of those overseen by the Nominating Authority which is highest achieving in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental and sustainability education.

3. The school meets all applicable federal civil rights and federal, state, local and tribal health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.

Name of Nominating Agency **Pennsylvania Department of Education**

Name of Nominating Authority **Ronald J. Tomalis, Secretary of Education**

I have reviewed the information in this application and certify to the best of my knowledge that the school meets the provisions above.

Ronald J Tomalis Date 2/14/13

(Nominating Authority's Signature)

Pennsylvania Department of Education
Nomination for Green Ribbon Schools Award
Nazareth Area Middle School, Nazareth Area School District

Located in Northampton County, the Nazareth Area Middle School (NAMS), built in 2009, serves 7th & 8th grade students of the Nazareth Area School District.

Throughout the planning and construction process, the students, staff, and community were fully engaged in the project—offering a vision and providing input on the new school building. With a goal to achieve USGBC LEED Silver Certification, the NAMS community was proud to receive LEED Gold certification due to the installation of a 574 kW solar photovoltaic system.

The NAMS building and grounds were thoughtfully planned and constructed in a manner that would reduce environmental impact. The 33.5 acre site maximizes open space and includes walking trails, outdoor classroom areas, a greenhouse and composting site, as well as numerous athletic fields for PE classes and team sports. An elaborate system of storm water drainage and retention areas were installed and water efficient landscaping that requires no irrigation. Water conservation happens inside the building as well, with low-flow plumbing fixtures and faucets used throughout the building.

During construction 75% of all construction waste was recycled and diverted from disposal. Materials used had at least 20% recycled content and over 25% of the materials were extracted, processed, and manufactured locally.

A comprehensive Indoor Air Quality Plan and Integrated Pest Management (IPM) program has been adopted and classrooms and other spaces are tested annually on a rotation basis to ensure the IAQ meets or exceeds standards. HVAC filters in classroom units are replaced three to four times per year, depending on use, and more if conditions warrant. The IPM program also ensures the use of non-chemical treatments for the removal of pests and when chemicals are necessary, students and staff are notified in advance and kept away from the areas as per regulations.

The building includes a Metasys system which monitors and controls all HVAC and mechanical equipment. A Lutron Lighting Control System works in conjunction with dimmable ballasts, day-lighting shelves in classrooms, and on-off sensors located throughout the building—and outdoors. These systems have allowed the NAMS to reduce its energy consumption and earn the Energy Star Portfolio Manager Score of 94 for 2012.

Two additional monitoring and information systems are also integrated into the building.—and used in the classroom. The Windows on the World (WOW) sustainability information system provides energy management and interactive sustainability education data for use by staff and students. WOW accesses data gathered by the building's gas, water, and electrical meters and consolidates it onto one convenient platform. Displayed on kiosk style touch screen displays and over the Web, WOW allows the building occupants and visitors to learn how the building is designed to conserve resources and preserve the natural environment. The real-time and historic resource consumption data can be used to compare and translate energy savings into tangible environmental benefits in support of sustainability education. The second system is DECK

Monitoring. Also displayed on a kiosk style touch screen and over the web, DECK monitors and tracks the building's solar system performance. It compares the output in terms of environmental offsets such as gallons of gas saved, tons of CO2 saved, or number of 60 watt bulbs that can be energized for 8 hours per day, etc.

Not only do these monitoring systems help buildings perform better, they are tools for students to use in classrooms as part of the environmental education program, and both systems have been incorporated into the school's science and math curriculums.

For example, science classes use the real time data from the building's monitoring systems to correlate the effect of temperature, humidity and wind on the consumption of energy to operate the school. Using the above systems and associated data, the NAMS has realized and can demonstrate a 6.7% reduction in non-transportation energy usage (Portfolio Manager & DECK) as well as a 47% reduction in GHG emissions from the PV solar system alone. Also, the NAMS recycling and composting program has achieved a 29% reduction in solid waste to date.

Environmental education is also enhanced through community partnerships. Working with an area business, Environmental Club students compost cafeteria waste and bring it to a local nature center where they created a learning center to describe their work. Similarly, the "Trout in the Classroom" program is a partnership with Trout Unlimited and the Pennsylvania Fish and Boat Commission, where students receive trout eggs in early November, hatching these eggs and caring for the fish until the release. During the course of the year students will be responsible for maintaining high water quality, feeding the trout, and learning about the life cycle of trout. In the spring, the students release the trout into a local water system in Jacobsburg Park in Nazareth.

Nazareth Area Middle School made a commitment to building an award winning, energy efficient building, and has demonstrated effective use of the building to achieve their energy management goals. With an environmental literacy graduation requirement, and high rates of proficiency in the science and ecology standards, NAMS has demonstrated its commitment to an interdisciplinary approach to environmental education that shows positive results.

School Contact Information
School Name : Nazareth Area Middle School
School District (if applicable) : Nazareth Area School District
Street Address : 94 Friedenstahl Avenue
City : Nazareth
State : Pennsylvania
Zipcode : 18064
School Website : www.ms.nazarethasd.k12.pa.us
Principal First Name : Robert
Principal Last Name : Kern
Principal Email Address : rkern@nazarethasd.org
Principal Phone Number : 610-759-3350 ext. 8005
Lead Applicant First Name (if different from principal) : Lewis
Lead Applicant Last Name (if different from principal) : Lengyel
Lead Applicant Email : llengyel@nazarethasd.org
Lead Applicant Phone Number : 610-759-1367 ext. 1702

Level: Middle (6-8 or 9)

School Type: Public

How would you describe your school? Suburban

Does your school have at least 40 percent of your students from a disadvantaged background? (students who are eligible for free and reduced-price school meals, students with disabilities, who are limited English proficient, migrant, or receiving services under Title I of the Elementary and Secondary Education Act): No

Pillar 1: Environmental Impact and Energy Efficiency
Buildings, grounds and operations goal: The school has reduced its environmental impact and is working towards net-zero impact (zero carbon, solid waste, and hazardous waste footprints).
Pillar 1 includes four main elements:

1) **Reduced greenhouse gas emissions, using an energy audit or emissions inventory and reduction plan, cost-effective energy efficiency improvements and on-site renewable energy and/or purchase of green power.**
2) **Improved water quality, efficiency, and conservation.**
3) **Reduced solid waste production, through increased recycling, reduced consumption, and improved management, reduction, or elimination of hazardous waste stream.**
4) **Expanded use of alternative transportation to, during and from school, through active promotion of locally-available options and implementation of enabling projects and policies.**

Each question in this section is designed to measure your school's progress towards Pillar 1 and its associated four elements.

1A1: In what year was your school constructed? 2009

1A2: What is the total building area of your school? 235,000 sf

1A3: Has your school constructed a new building or renovated an existing building in the past ten years? No

Please provide the following information:
Percentage of the building area that meets green build standards (for example: LEED, CHPS, Green Globes or other standards) : 100%
Which certification did you receive and at what level? : Applied for Gold Level - LEED
What is the total constructed area? : 235,000 sf
What is the total renovated area? : 0

1A4: Do any parts of your existing buildings meet green build standards (for example: LEED, CHPS, Green Globes, or other standards)? Yes

Please provide the following information:
What percentage of the existing building area has achieved green build standards (LEED, CHPS, Green Globes, or other standards)? : 100%
What is the total building area (in sq. ft.)? : 235,000 sf
Which certificate did the school receive and at what level? : LEED for New Construction - Gold NC 2.2

1A5: Please indicate which green building practices your school is using to ensure your building is energy efficient.
School has an energy and water efficient product purchasing and procurement policy in place.
Other (please describe): The Facility Energy Management System installed and in use is the Johnson Controls, Inc. metasys system. Also incorporated with the new construction was a Lutron lighting management system. School Building has been assessed using the Federal Guiding Principles Checklist in Portfolio Manager.

1A6: Has your school received EPA ENERGY STAR certification or does it meet the requirements for ENERGY STAR certification? Yes
If your school received the certification, please note the year it was achieved and the score received.
2012 – 94

1A7: Has your school reduced its total non-transportation energy use from an initial baseline? Yes

Please provide the following information:
Percentage reduction : 6.7%
Measurement unit used (kBTU/square foot, kBTU/student, annual therms, etc.) : kBTU/Sq. Ft.
Time period measured (mm/yyyy-mm/yyyy) : 12/2011 - 9/2012
How did you document this reduction (i.e. ENERGY STAR portfolio, district report)? : Energy Star Portfolio

1A8: What percentage of your school's energy is obtained from:
On-site renewable energy generation (i.e. solar, wind, biomass) : Solar - 46.2%
Purchased renewable energy : 46.2%

1A9: Can your school demonstrate a reduction in its Greenhouse Gas emissions? Yes

Please provide the following information:
Initial GHS emissions rate (MT eCO2/person) : .99 802/810 Students & Staff
Final GHG emissions rate (MT eCO2/person) : .53 431/810 Students & Staff
Percentage reduction : 46.4%
Time period measured (mm/yyyy-mm/yyyy) : 12/2011 - 09/2012
How did you document this reduction (e.g., the inventory module from Clean Air Cool Planet's Campus Carbon Calculator, EPA Portfolio Manager)? : EPA Emission Factor Conversion

1A10: Does your school reduce and/or offset the greenhouse gas emissions from building energy use? Yes
Please provide the following information:
List offsets used : On-site Solar
Current total GHG emissions (MtCO2e) : 431 = .00068956 x 624,482kWh
Baseline total GHG emissions (MtCO2e) : 802 = .00068956 x 1,162,566kWh
Change from baseline : (371)
Time period measured (mm/yyyy-mm/yyyy) : 12/2011 - 09/2012

1B1: What percentage of your students walk, bike, bus, or carpool (2+ students in the car) to/from school?
75% Bussed, 15% Walk or Bike, 7% Carpool

1B2: How was this data collected and calculated? (Maximum 100 words)
The Elementary and Intermediate Schools were asked to provide a listing of parent drop offs and pick-ups where less than 3 passengers were riding per vehicle. (i.e., 1 parent + 1 student).
Surveys were sent to the Middle and High Schools to determine the number of passengers riding in cars to/from school. Based on this information, we determined that 3% of our student population is either driving themselves (high school) or being driven with no other passengers in the car.

1B3: Which of the following policies or programs has your school implemented:
Our school has a well-publicized no idling policy that applies to all vehicles (including school buses).
Vehicle loading/unloading areas are at least 25 feet from building air intakes, doors, and windows.
Our school has established Safe Pedestrian Routes to school which are distributed to parents and posted in our office.
Our school promotes bike/ped programs.
Our school has designated carpool parking stalls.

1B4: Describe how your school transportation use is efficient and environmentally benign (e.g. the percentage of school-owned electric/hybrid/alternative fuel vehicles in your fleet, or other indicators of significant reductions in emissions):
Nazareth Area School District currently contracts with a bus company consisting of 64 buses and 25 vans. Approximately 50% of the fleet is equipped with oxidation catalysts, and there is one Hybrid bus.

1C1: Can you demonstrate a reduction in your school's total water consumption (measured in gallons/occupant) from an initial baseline? No

Please provide the following information:
1C2: Which of the following practices does your school employ to increase water efficiency and ensure water quality? (Please check all that apply)
Our school conducts annual audits of the facility and irrigation systems to ensure they are free of significant water leaks and to identify opportunities for savings.
Our school's landscaping is water-efficient and/or regionally appropriate.
Taps, faucets, and fountains at our school are cleaned at least twice annually to reduce contamination and screens and aerators are cleaned at least annually to remove particulate lead deposits.
Our school has a program to control lead in drinking water (including voluntary testing and implementation of measures to reduce lead exposure).
Our school has implemented stormwater best management practices and/or low-impact development strategies (i.e. rain gardens, vegetated swales, pervious paving, rainwater harvesting, green roofs).
Our school uses water control features in bathrooms, locker rooms, kitchens, etc. that include, low flow faucets, automatic sensor faucets, low flow toilets and shower heads.

Please provide the following information about your school's landscaping
What percentage of your total landscaping is considered water-efficient or regionally appropriate? : 100%
What types of plants are used and where are they located? : 1. Courtyard - Compact Burning Bush, Blue Chip Juniper, Korean Spice Viburnum, Japanese Spiraea. 2. Perimeter of Building - Yoshino Cherry Trees, Red Maple. 3. Along Main Road - Red Maple, Red Oak, Green Ash. 4. Internal Roads of Complex - Red Oak, Red Maple, Green Ash. 5. Rear Property Line - Douglas Firs. 6. Flower Beds - Korean Spice Viburnum, Japanese Spiraea, Blue Chip Juniper.

Please describe the alternate water sources used for irrigation or toilet flushing. (Maximum 100 words)
Please describe the program you have in place to control lead in drinking water. (Maximum 100 words)
Water is supplied to the building via a municipal water system which is filtered and treated at the plant. At the building level, filtration devices to remove lead and other contaminants are installed on all water fountains and are changed annually as directed by the manufacturer.

Please describe your best management practices for stormwater. (Maximum 200 words)
Throughout the entire building complex, stormwater catch basins and associated piping collect and direct all stormwater to an on-site retention pond. The stormwater is then filtered and released into the Schoeneck Creek which runs through the school's property.

1C3: Our school's drinking water comes from:
Municipal water source

Please describe how the water source is protected from potential contaminants. (Maximum 100 words)
1C4: Please describe any additional progress your school has made towards improving water quality, efficiency, and conservation. (Maximum 200 words)
An example is the Trout in the Classroom (TIC) program where students are exposed to the life cycle of trout, importance of cold water conservation, and the impact human activity has on the environment and maintaining cold water. This would include the effects of poor land use (stream and bank erosion/non-point source pollution/geomorphology/and habitat restoration), poor farming practices (run-off/sedimentation/soil conservation), non-native invasive species, and other common practices. In addition, through this project students are responsible for maintaining the aquarium, testing the water on a regular basis, and the troubleshooting water quality. Students are not only responsible for maintaining a suitable habitat for raising the trout they are also responsible for making observations and collecting data about their life cycle. Similarly, students also responsible for making observations and collecting data about their life cycle. Similarly, students also conduct scientific investigation involving decomposition. Students compost trash from the school cafeteria. The compost is then used to conduct soil quality and its impact on plant growth using the green house. The soil is also then taken to a local trail/nature center through a partnership with Hercules Cement.

1C5: What percentage of the school grounds are devoted to ecologically or socially benefical uses (school vegetable garden, wildlife or native plant habitats, outdoor classroom, environmental restoration projects, rain garden, pervious walking or running trails, etc.)? 10%

1C6: Do any parts of your outdoor landscape meet the National Sustainable Sites Initiative guidelines? If Yes, please explain. No

1D1: What percentage of solid waste is diverted from landfilling or incinerating due to reuse, recycling and/or composting (i.e. Recycling Rate)?
A - Monthly garbage service in cubic yards (garbage dumpster size(s) x number of collections per month x percentage full when emptied or collected). : 160
B - Monthly recycling volume in cubic yards (recycling dumpster sizes(s) x number of collections per month x percentage full when emptied or collected). : 64
C - Monthly compostable materials volume(s) in cubic yards (food scrap/food soiled paper dumpster sizes(s) x number of collections per month x percentage full when emptied or collected). : 2
Recycling Rate = ((B+C) / (A+B+C) x 100) : 29.2 %

1D2: Does your school have a composting system? Yes

1D3: Please provide the following information about your school's hazardous waste:
How much hazardous waste does your school produce (lbs/person[staff+students]/year)? : 0
List the types of hazardous waste generated : none generated at this site

1D4: Which of the following benchmarks has your school implemented to minimize and safely manage hazardous waste? (Please check all that apply)
Our school disposes of unwanted computer and electronic products through an approved recycling facility or program.
All our computer purchases are Electronic Product Environmental Assessment Tool (EPEAT) certified products.
Our school has a hazardous waste policy for storage, management, and disposal that is actively enforced.

List the green cleaning standard(s) used.

1D5: Does your school use "third party certified" green cleaning products? Yes

Please provide the following information about the green cleaning products used in your school:
What specific green cleaning product standard (Green Seal, Ecologo, etc.) does the school use? : National Sanitation Foundation
What percentage by volume of all cleaning products in use are "third party certified" green cleaning products? : 95%

1D6: What other indicators do you have of your school's reduction of solid waste and elimination of hazardous waste? (Maximum 200 words)
The use of technology to communicate throughout the school, District, and community has greatly reduced the amount of hard copy paper being used by the school. In addition, electronic storage of all files is utilized throughout the building. A hydrogen peroxide sanitizer with 2 dilution rates accounts for 95% of all cleaning products used, virtually eliminating the use of harsh or hazardous chemicals. Recycling of paper, cardboard, and co-mingled items is practiced on a daily basis. Our contracted refuse hauler has placed separate dumpsters on site to collect the materials. They are picked up twice weekly and processed at a local recycling facility.

1D7: This is the end of Pillar 1. Please describe any other accomplishments or progress your school has made towards reducing/eliminating environmental impacts or improving your energy efficiency. (Maximum 200 words)
The installation of the roof mounted solar system has proved to be very beneficial to the Middle School and the District as a whole and has a positive impact on the environment. The array is a 12 degree, fixed tilt, 574 kW (DC) photovoltaic system that produces 668,828 kWh's of renewable energy annually or approximately 46% of the building's annual electrical consumption.The module roof coverage is 30% which allows the PV system to maximize the annual renewable energy harvest and delivers the full capacity of the renewable energy investment.
The PV system greatly reduces the reliance on the conventional energy resource supplied via the utility grid and reduces the amount of GHG emissions significantly.
The project also included an interactive Renewable Energy Education Program. The program provides hands-on activity guides and science kits as well and has been incorporated into the school's curriculum using real time data from the PV system.
The Middle School has also entered into a demand response program. When an event is called during peak demand (summer months), the Middle School has agreed to drop to a 0 kW load and run the building strictly on emergency power via a natural gas generator.

Pillar 2: Healthy School Environments

Healthy student and staff environment goal: The school improves the health and performance of students and staff.

Pillar 2 includes two main Elements:

A) **An integrated school environmental health program based on an operations and facility-wide environmental management system that considers student and staff health and safety in all practices related to design, construction, renovation, operations, and maintenance of schools and grounds.**
B) **High standards of nutrition, fitness, and quantity of quality outdoor time for both students and staff.**

Each question in this section is designed to measure your school's progress toward Pillar 2.

2A1: Which of the following practices does your school employ with regards to pest management? (Please check all that apply)

Our school has an integrated pest management plan in place to reduce and/or eliminate pesticides.
Pest control policies, methods of application, and posting requirements are provided to parents and school employees.
Copies of pesticide labels, copies of notices, MSDS and annual summaries of pesticide applications are all available and in an accessible location.
Our school prohibits children from entering a treated area for at least 8 hours after the treatment or longer if required by the pesticide label.

2A2: Which of the following practices does your school employ to improve contaminant control and ventilation? (Please check all that apply)

Our school has a comprehensive indoor air quality management program that is consistent with EPA's Indoor Air Quality (IAG) Tools for Schools.
Our school meets ASHRAE Standard 62.1-2010 (Ventilation for acceptable indoor air quality).
Our school has installed one or more energy recovery ventilation systems to bring in fresh air while recovering the heating or cooling from the conditioned air.
Our school has eliminated mercury-containing thermometers, chemical compounds, art chemicals, etc. and elemental mercury.
Our school disposes of any unwanted mercury laboratory chemicals, thermometers and other devices in accordance with federal, state, and local environmental regulations.
Our school has CO alarms that meet the requirements of the National Fire Protection Association code 720.
There are no wood structures on school grounds that contain chromate copper arsenate.
Our school visually inspects all structures on a monthly basis to ensure they are free of mold, moisture, and water leakage.
Our school's indoor relative humidity is maintained below 60%.
Our school has moisture resistant materials/protective systems installed (i.e. flooring, tub/shower, backing, and piping).
Our school prohibits smoking on campus and in public school buses.
If your school has combustion appliances, is there an inventory of them and are they annually inspected to ensure they are not releasing Carbon Monoxide? (yes/no/no combustion appliances): The building has five (5) gas fired boilers with CO monitoring. They are inspected annually to measure efficiency and ensure they are not releasing CO.
Our school has a chemical management program that inludes: chemical purchasing policy (low or no-VOC products), storage and labeling, training and handling, hazard communication, spills (clean up and disposal), and selecting EPA's Design for the Environment approved cleaning products.

2B1: Which practices does your school employ to promote nutrition, physical activity and overall school health? (Please check all that apply)

Our school partners with local food growers to supply produce.
Our students spent an average of 120 minutes per week over the past year in school supervised physical education.
At least 50% of our students' annual physical education takes place outdoors.
Our school participates in the USDA's Healthier School Challenge or another nutrition recognition program.

Please list your school's USDA Healthier School Challenge award level or describe other nutrition program. (Maximum 100 words)

The Nazareth Area School District Food Service Program serves nutritious and well balanced meals as part of the National School Lunch Program. Students are offered a variety of fresh fruits and garden salads every day in all cafeterias. The Food Service Program works closely with parents and students with regards to allergies and carbohydrates. A list of allergens and all carbohydrates from district menus are offered on the food service web page of the district web site. In addition, these lists are also shared with nurses in each building to assist them with student needs.

Please describe the type of outdoor exercise opportunities and nature-based recreation available to students. (Maximum 200 words)
The new middle school has built a walking trail that encompasses the middle school complex. Students utilize the trail to walk/run during their P.E. and Fitness classes. The outdoor all-weather track also provides a sufficient and safe area (fenced in) for students to run and walk. The P.E. Department utilizes many outdoor fitness activities for students. Archery is offered every spring and fall which takes place on one of our outdoor athletic fields. Students are given the opportunity to learn basic kayaking skills in the pool with our certified instructors. Even though this kayaking activity is held indoors, it can easily translate into an outdoor activity. The students are also engaged in a composting program that utilizes various food scraps from the cafeteria and produces compost, the composter is next to our outdoor greenhouse which is used for various plant activities in our science curriculum. Students also take field trips to the Jacobsburg Park. The field trips are designed to enhance plant/stream life knowledge and are also filled with many hiking trails. The trout growth and release program are also part of this field trip. Students get into the stream to release the trout they have raised in the classroom.

2B2: Our school encourages teaching and learning outdoors on school property or has opportunities in neighboring public open spaces; such as parks, trails, or community gardens. If yes, please explain.
Yes: Our school has an environmental club that has fostered a relationship with Hercules Cement. Through this partnership, students compost trash from our cafeteria and take the compost to a nature center developed by Hercules. Students also created a learning center to describe their work with composting at the nature center for local community members that use this nature center. Similarly, our "trout in the classroom" program funded by the Forks of the Delaware Chapter of Trout Unlimited and by a Grant from the PA Council of Trout Unlimited and the Pennsylvania Fish and Boat Commission Sport fishing and Aquatic Resource Education Grant", students receive trout eggs in early November, hatching these eggs and caring for the fish until the release date in the spring. During the course of the year students will be responsible for maintaining high water quality, feeding the trout, and learning about the life cycle of trout. In the spring, the students release the trout into a local water system in Jacobsburg Park in Nazareth. The students also rotate through five stations emphasizing the issues taught in the classroom. These activities are enhanced with the help and expertise of the Jacobsburg Park Staff.

2B3: What percentage (by cost) of food purchased by your school is certified as "environmentally preferable" (e.g. Organic, FairTrade, Food Alliance, Rainforest Alliance, etc.)? 0%

2B4: This is the end of Pillar 2. Please describe any additional progress your school has made <u>in terms of the school's built and natural environment</u> (including unique community and/or business partnerships) to promote overall student and staff health and safety. (Maximum 200 words)
Our school has an environmental club that has fostered a relationship with Hercules Cement. Through this partnership student compost trash from our cafeteria and take the compost to a nature center developed by Hercules. Students also created a learning center to describe their work with composting at the nature center for local community members that use this nature center. This involves the students interacting with other age groups and enhances their ability to communicate effectively. Similarly, our "trout in the classroom" program was also funded by the Forks of the Delaware Chapter of Trout Unlimited and by a Grant from the PA Council of Trout Unlimited and by a Grant from the PA Council of Trout Unlimited and the Pennsylvania Fish and Boat Commission Sport Fishing and Aquatic Resource Education Grant".

<u>Pillar 3: Environmental and Sustainability Education</u>
Student achievement goal: <u>Provide effective environmental and sustainability education, incorporating STEM, civic skills and green career pathways</u>.
Pillar 3 includes three main Elements:

A) **Interdisciplinary learning about the key relationships between dynamic environmental, energy and human systems.**
B) **Use of the environment and sustainability to develop STEM content knowledge and thinking skills to prepare graduates for the 21st century technology-driven economy.**

C) Development of civic engagement knowledge and skills, and students' application of these to address sustainability and environmental issues in their community.

Each question in this section is designed to measure your school's progress toward Pillar 3.

3A1: Is your school district's curriculum aligned to the Pennsylvania Environmental and Ecology standards?
Yes

3A2: Which practices does your school employ to help ensure the environmental and sustainability literacy of your graduates? (Please check all that apply)
Environmental and sustainability concepts are integrated into classroom based and schoolwide assessments.
Professional development opportunities in environmental and sustainability education are provided for all teachers.
Environmental and sustainability concepts are integrated throughout the curriculum.

Please describe your school's environmental or sustainability literacy graduation requirement. (Maximum 200 words)

Please describe your classroom based on schoolwide assessments in environmental and sustainability concepts and include what percentage of students scored "proficient" or better. (Maximum 200 words)
Our school integrates into its common summative assessments questions that align to environmental and sustainability concepts that are taught throughout our curriculum. We also have common project based assessments. Some of the topics that are addressed and assessed are:
*Sustainability of natural resources
*Recycling
*Water use/conservation
*Life cycle of trout and the importance of cold water conservation
*Energy use/conservation
*Composting
*Carbon foot printing
*Green House Effect
*Renewable and non-renewable systems
*Energy flow through an ecosystem
70% of our students demonstrated proficiency on the 2011 PA State Science Assessment (PSSA Science) in the area of S8.B.3 - Ecological Behavior and Systems in grade 8. In addition, 77% of our students demonstrated proficiency in the standard area of S8.D.1 - Earth Features and Processes that Change Earth and Its Resources.

Please describe professional development opportunities available in environment and ecology standards. Include the percentage of teachers who participated in these opportunities over the past 2 years. (Maximum 200 words)
Our teachers have participated in several outreach programs that support classroom teachers in the integration of STEM related topics as well as environmental studies in their curriculum. Some of the programs have included:
*Defined STEM into the Classroom 2011: Explored the defined STEM application designed to promote effective and relevant connections between STEM in the classroom
*ASM Materials Camp 2011 through Lehigh University: This week long camp demonstrated how to use low cost, simple labs and experiments using everyday materials and expand student learning in incorporating STEM concepts.
*Dashboard Training: Teachers were training on the use and incorporation into their classroom of a dashboard system that monitors water and energy use in our building.
Approximately 43% of our middle school science and technology teachers have participated in training the Defined STEM and Materials Camp combined and 100% of the science teachers have been training on the use and integration of the Dashboard system

3A3: If your school serves grades 9-12, please provide the following information:

3B1: Do your school's science courses frequently use sustainability and the environment as a context for learning science (such as asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, using mathematics and computational thinking, constructing explanations, and engaging in argument from evidence when exploring environmental and sustainability issues)? Yes

Please describe. (Maximum 200 words)
Yes. One of the examples is the Trout in the Classroom (TIC) program where students are exposed to the life cycle of trout, importance of cold water conservation, and the impact people have on the environment. In this project students are responsible for maintaining the aquarium, testing the water on a regular basis, and troubleshooting water quality. Students are not only responsible for maintaining a suitable habitat for raising the trout, but also responsible for making observations and collecting data about their life cycle. Similarly, students also conduct scientific investigation involving decomposition. Students compost trash from the school cafeteria. The compost is then used to conduct soil quality and its impact on plant growth using the green house. The soil is then taken to a local trail/nature center through a partnership with Hercules Cement Company. Also, the information obtained from the various kiosks (water, gas, solar) is used in various mathematical and computational problem solving.

3B2: Since green/sustainable concepts cross curriculum areas, where within the following standards content are they being taught, at what grade levels and what main resources are being used?

	What Standard Areas	Main Content Addressed	Grade Levels	Main Resources
1	Ecology	Describe the relationships between biotic and abiotic components of an ecosystem	8	Composting, curricular materials
2	Materials Cycle	Explain biogeochemical cycles within an ecosystem.	8	Recycling, Composting, Dashboard
3	Energy Flow	Explain the flow of energy within an ecosystem.	8	Recycling, Composting, Dashboard
4	Aquatic Ecosystems	Use appropriate tools and techniques to analyze a freshwater environment.	8	Trout aquarium, pH
5	Natural Resources	Compare and contrast alternative sources of energy.	8	Dashboard, Curricular materials
6	Pollution	Describe how humans can reduce pollution.	8	Curricular materials, Recycling
7	Sustainability	Best Management Practices (BMP) can be used to mitigate environmental problems.	8	

3B3: Does your school have a STEM curriculum and/or coordinator? No
Please explain. (Maximum 200 words)

3B4: Has the school's use of green building materials, alternative or renewable energy sources or green technologies, been incorporated into the curriculum and/or utilized by teachers and students in the classroom? Yes

Please explain. (Maximum 200 words)
Yes, as evidenced from the various classroom projects initiated using the dashboard system to monitor water and energy consumption in the building. Also, using Deck Monitoring for the roof mounted pv solar system, students can view and use real time data in regards to solar power being generated and actual kWh generated to date. Generation offsets are also listed to date which has also been incorporated into the

classroom curriculum. Examples of these are as follows: 1. Number of 60 watt bulbs that can be in use for 1 year @ 8 hours/day 2. CO2 offsets in number of trees 3. Tons of CO2 saved based on amount of generation 4. Gallons of gas saved.

3B5: If your school is a high school, does your school curriculum make connections between classroom and college and career readiness, in particular post-secondary options in environmental and sustainability fields? N/A

Please describe these college and career connections. (Maximum 200 words)

3C1: Do students conduct an age-appropriate, self-selected, civic/community engagement project at every grade level? Yes

3C2: Do students have meaningful outdoor learning experiences (experiences that engage students in critical thinking, problem solving and decision making) at every grade level? Yes

Please share how outdoor learning is used to teach an array of subjects in contexts, engage the broader community, and develop civic skills. (Maimum 200 words)
Our school has an environmental club that fostered a relationship with Hercules Cement Company to develop a nature center where students compost trash from our cafeteria to the center. There, they describe their work to local community members. Similarly, in our "trout in the classroom" program, students receive trout eggs in early November, hatching these eggs and caring for the fish until the release date in the spring. During the course of the year, students will be responsible for maintaining high water quality, feeding the trout, and learning about the life cycle of trout. In the spring, the students release the trout into a local water system in Jacobsburg Park in Nazareth. The trout project is cross-curricular. In math class, students apply their knowledge of formulas to find the flow rate of a stream through a "hands-on" activity during the release trip at Jacobsburg Park. In English class, the students will identify non-native invasive species. They will use Reading Apprenticeship Strategies in order to formulate and organize ideas into a cohesive argument to be presented in their writing of a persuasive letter urging their local politicians to support actions preventing non-native species from invading local area.

3C3: What opportunities exist for parents to learn about the green practices implemented at your school, including how these practices are benefiting the children and reducing operation and maintenance costs?
The middle school takes many opportunities to educate parents and students into green practices. We have three monitors/kiosks inside our school to monitor water, electric, and gas useage as well as solar panel electric production. The solar panel monitor is web based for all to see. During numerous open houses and events throughout the year, parents are informed of the opportunity to view this information over the web. We save paper by utilizing a parent email and documentation notification system. No hard copy papers are sent home with students, everything is done electronically. We have estimated during the last three years we have saved over five million sheets of paper. We have implemented a recycling program for bottles, plastic, and paper. Throughout the school there are special recycling bins for cans and plastic bottles. We have various groups that collect used cell phones for recycling purposes. The school utilizes energy efficient lighting and water saving devices. We also incorporated hand dryers instead of using paper products.

3C4: Please describe your partnerships with the local community (e.g., academic, business, government, nonprofit and informal science institutions) to help advance your school, other schools (especially schools with fewer resources) and the greater community toward the 3 Pillars. Include both the scope and impact of these partnerships. (Maximum 300 words)
Our school has an environmental club that has fostered a relationship with Hercules Cement. Through this partnership, students compost trash from our cafeteria and take the compost to a nature center developed by Hercules. Students also created a learning center to describe their work with composting at the nature center for local community members that use this nature center. Similarly, our trout in the classroom program was also funded by the Forks of the Delaware Chapter of Trout Unlimited and by a grant from the PA Council of Trout Unlimited and the "Pennsylvania Fish & Boat Commission Sport Fishing & Aquatic Resource Education Grant".

3C5: This is the end of Pillar 3. Please describe other methods and measurements your school uses to ensure matriculating students are environmentally and sustainability literate. (Maximum 200 words)

We use common unit assessments and benchmark assessments that are aligned to PA Environmental Science Standards.

The science curriculum has a unit on ecology and sustainability. The students discuss renewable resources and non-renewable resources. This is coupled with the Geography class in which students discuss natural resources of each country in the world. The teachings include the various countries that have major energy needs and how it effects the GPA and living conditions of each citizen in that particular country. New energy is also discussed at this time and comparisons made to countries that are ahead in utilizing natural energy sources to meet the populations demand for energy. The geography class also discusses the need for the rain forests, the depletion of them, and the consequences of their destruction.